

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In re Application of:**

Harrup et. al.

**Serial No.:** Not Yet Assigned

**Filed:**

**For:** ORGANIC/INORGANIC  
NANOCOMPOSITES, METHODS OF  
MAKING, AND USE AS A PERMEABLE  
REACTIVE BARRIER

**Confirmation No.:** Unknown

**Examiner:** Unknown

**Group Art Unit:** Unknown

**Attorney Docket No.:** B-214

**NOTICE OF EXPRESS MAILING**

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**INFORMATION DISCLOSURE STATEMENT**

**MAIL STOP PATENT APPLICATION**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In compliance with the duty to disclose information material to patentability pursuant to 37 C.F.R. § 1.56, it is respectfully requested that this Information Disclosure Statement be entered and the documents listed on attached Form PTO/SB/08 be considered by the Examiner and made of record. Copies of the listed documents are enclosed pursuant to 37 C.F.R. § 1.98(a).

In accordance with 37 C.F.R. § 1.97(g) and (h), filing of this Information Disclosure Statement is not to be construed as a representation that a search has been made or an admission that the information cited herein is, or is considered to be, material to patentability as defined in

37 C.F.R. § 1.56(b). Further, no representation is made by Applicants herein that no other possible material information as defined in 37 C.F.R. § 1.56(b) exists.

<u>U.S. Patent Documents</u>		
<u>U.S. Patent No.</u>	<u>Publication Date</u>	<u>Patentee</u>
US - 3,817,911	06/18/1974	Taylor
US - 4,772,660	09/20/1988	Kitamura et al.
US - 4,827,005	05/02/1989	Hilterhaus
US - 6,146,787	11/14/2000	Harrup et al.
US - 6,217,775 B1	04/17/2001	Conca et al.
US - 6,254,786 B1	07/03/2001	Carpenter et al.
US - 6,357,968 B1	03/19/2002	Dwyer et al.
US - 6,398,960 B1	06/04/2002	Borden et al.
US - 6,403,364 B1	06/11/2002	Hince
US - 6,403,755 B1	06/11/2002	Stewart et al.
US - 6,423,531 B1	06/23/2002	Hince et al.
US - 6,428,695 B1	08/06/2002	Naftz et al.
US - 6,432,693 B1	08/13/2002	Hince
US - 6,524,485 B1	02/25/2003	Dubin et al.
US - 6,544,690 B1	04/08/2003	Harrup et al.

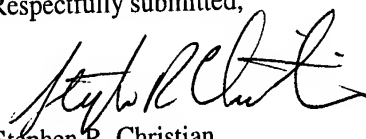
Other Documents

- Wertsching, A., et al., Examination of the Physical Properties of Polyphosphazene-Silicate Nanocomposites Using Novel Synthetic Strategies, a submission to Composite Interfaces, Idaho Nat'l. Eng. and Environmental Lab.
- Caruana, Alex, 1,200-Foot Permeable Reactive Barrier in Use at the Denver Federal Center, State of Colorado, Dept. of Health and Environment
- Novak, Bruce M., et al., Simultaneous Interpenetrating Networks of Inorganic Glasses and Organic Polymers, New Routes into Nonshrinking Sol-Gel Derived Composites, Dept. of Chem., Univ. of California at Berkeley, pp. 698-699.
- David, I.A., et al., A Molecular Organic/Inorganic Semi-Interpenetrating Network, Du Pont Central Research and Development Experimental Station, pp. 530-531.
- Messersmith, P.B., et al., Synthesis of New Materials: Organoceramics, Univ. of Illinois, Dept. of Materials Science and Eng., pp. 536-537.
- Bungay, P.M., et al. (eds.), Synthetic Membranes: Science, Engineering and Applications, NATO ASI Series, Series C: Mathematical and Physical Sciences Vol. 181, pp. 57-107, 1986, D. Reidel Publishing Co.
- Sebesta, F., et al., Composite Ion Exchanger with Ammonium Molybdophosphate and its Properties, Journal of Radioanalytical and Nuclear Chem., Vol. 140, No. 1 (1990), pp. 15-21.
- Novak, Bruce M., Hybrid Nanocomposite Materials--Between Inorganic Glasses and Organic Polymers, VCH Verlagsgesellschaft mbH, D-69469, Weinheim, 1993, pp. 422-433.
- Wen, Jianye, et al., Organic/Inorganic Hybrid Network Materials by the Sol-Gel Approach, Chem. Mater., Vol. 8, No. 8, 1996, pp. 1667-1681.
- Benner, S.G., et al., Porous Reactive Wall for Prevention of Acid Mine Drainage: Results of a Full-Scale Field Demonstration, International Containment Technology Conference, Conference Proceedings, Feb. 9-12, 1997, pp. 835-843.
- Powell, Robert M., et al., Permeable Reactive Barrier Technologies for Contaminant Remediation, EPA/600/R-98/125, Sept. 1998, pp. 1-94, U.S. Gov't. Printing Office.
- Satyanarayana, J., et al., Adsorption Studies of Cesium on a New Inorganic Exchanger Ammonium Molybdophosphate—Alumina (AMP – Al<sub>2</sub>O<sub>3</sub>), Journal of Radioanalytical and Nuclear Chem., Vol., 242, No. 1 (1990), pp. 11-16.
- Field Applications of In Situ Remediation Technologies: Permeable Reactive Barriers, U.S. Environmental Protection Agency, EPA-542-R-99-002, April 1999, pp. 1-114.
- Moridis, George J., et al., Evaluation of Alternative Designs for an Injectable Subsurface Barrier at the Brookhaven National Laboratory Site, Long Island, New York, Water Resources Research, Vol. 35, No. 10, October 1999, pp. 2937-2953.
- In Situ Permeable Reactive Barriers: Application and Deployment Training Session, EPA/ITRC/RTDF, Feb. 8-9, 2000,.
- Ott, Nichole, Permeable Reactive Barriers for Inorganics, U.S. Environmental Protection Agency, July 2000, pp. 1-58.
- Polson, Linda, et al., Synthesis, Characterization, and Ion Sequestration of Novel Nanocomposite Materials (4/02)
- Nanocomposite Permeable Reactive Barrier Research at the INEEL (2/03)

Applicants offer to supply any explanation or discussion of the documents that the Examiner feels is necessary or desirable and which is requested.

This Information Disclosure Statement is filed within three (3) months of the filing date of the above-identified application, and no certification pursuant to 37 C.F.R. § 1.97(c) or a fee pursuant to 37 C.F.R. § 1.17(p) is required.

Respectfully submitted,



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Date: 9 Dec 2003

Enclosures: Form PTO/SB/08  
Cited Documents

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>		Application Number	Not Yet Assigned
		Filing Date	
		First Named Inventor	Harrup et. al.
		Group Art Unit	Unknown
		Examiner Name	Unknown
(use as many sheets as necessary)		Attorney Docket Number	B-214
Sheet	1	of	3

U.S. PATENT DOCUMENTS					
Examiner Initials *	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code <sup>2</sup> (if known)			
		US-3,817,911	06/18/1974	Taylor	
		US- 4,772,660	09/20/1988	Kitamura et al.	
		US- 4,827,005	05/02/1989	Hilterhaus	
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		US- 6,357,968 B1	03/19/2002	Dwyer et al.	
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		US- 6,544,690 B1	04/08/2003	Harrup et al.	
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FOREIGN PATENT DOCUMENTS						
Examiner Initials *	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)				

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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet 2 of 2

**Complete if Known**

Application Number	Not Yet Assigned
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Group Art Unit	Unknown
Examiner Name	Unknown
Attorney Docket Number	B-214

**OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		Wertsching, A., et al., Examination of the Physical Properties of Polyphosphazene-Silicate Nanocomposites Using Novel Synthetic Strategies, a submission to Composite Interfaces, Idaho Nat'l. Eng. and Environmental Lab.	
		Caruana, Alex, 1,200-Foot Permeable Reactive Barrier in Use at the Denver Federal Center, State of Colorado, Dept. of Health and Environment	
		Novak, Bruce M., et al., Simultaneous Interpenetrating Networks of Inorganic Glasses and Organic Polymers, New Routes into Nonshrinking Sol-Gel Derived Composites, Dept. of Chem., Univ. of California at Berkeley, pp. 698-699.	
		David, I.A., et al., A Molecular Organic/Inorganic Semi-Interpenetrating Network, Du Pont Central Research and Development Experimental Station, pp. 530-531.	
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		Bungay, P.M., et al. (eds.), Synthetic Membranes: Science, Engineering and Applications, NATO ASI Series, Series C: Mathematical and Physical Sciences Vol. 181, pp. 57-107, 1986, D. Reidel Publishing Co.	
		Sebesta, F., et al., Composite Ion Exchanger with Ammonium Molybdophosphate and its Properties, Journal of Radioanalytical and Nuclear Chem., Vol. 140, No. 1 (1990), pp. 15-21.	
		Novak, Bruce M., Hybrid Nanocomposite Materials--Between Inorganic Glasses and Organic Polymers, VCH Verlagsgesellschaft mbH, D-69469, Weinheim, 1993, pp. 422-433.	
		Wen, Jianye, et al., Organic/Inorganic Hybrid Network Materials by the Sol-Gel Approach, Chem. Mater., Vol. 8, No. 8, 1996, pp. 1667-1681.	
		Benner, S.G., et al., Porous Reactive Wall for Prevention of Acid Mine Drainage: Results of a Full-Scale Field Demonstration, International Containment Technology Conference, Conference Proceedings, Feb. 9-12, 1997, pp. 835-843.	
		Powell, Robert M., et al., Permeable Reactive Barrier Technologies for Contaminant Remediation, EPA/600/R-98/125, Sept. 1998, pp. 1-94, U.S. Gov't. Printing Office.	

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<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

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		Attorney Docket Number	B-214
(use as many sheets as necessary)			
Sheet	1	of	3

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		Satyanarayana, J., et al., Adsorption Studies of Cesium on a New Inorganic Exchanger Ammonium Molybdophosphate—Alumina (AMP – Al <sub>2</sub> O <sub>3</sub> ), Journal of Radioanalytical and Nuclear Chem., Vol., 242, No. 1 (1990), pp. 11-16.	
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		Moridis, George J., et al., Evaluation of Alternative Designs for an Injectable Subsurface Barrier at the Brookhaven National Laboratory Site, Long Island, New York, Water Resources Research, Vol. 35, No. 10, October 1999, pp. 2937-2953.	
		In Situ Permeable Reactive Barriers: Application and Deployment Training Session, EPA/ITRC/RTDF, Feb. 8-9, 2000.	
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